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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/653,513

09/02/2003

Brian L. Lawrence

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11/02/2006

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EXAMINER

AZEMAR, GUERSSY

ART UNIT

PAPER NUMBER

2613

DATE MAILED: 11/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/653,513	LAWRENCE, BRIAN L.	
	Examiner	Art Unit	
	Guerssy Azemar	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 5, 8, 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Otani et al. (20020191259).

(1) With respect to claims 1 and 8:

As shown in figure 1, Otani et al. teaches An all-optical regenerator, comprising:

an optical signal input node for receiving an input optical signal (14 in figure 1), the input optical signal including data (X(Gbit/s) in figure 1, it should be noted that this is a data rate); and

a regenerator waveguide (20A in figure 1) receiving the input optical signal (output of coupler 18 in figure 1) and an optical clock signal (X/2(GHz) in figure 1), and producing an output optical signal re-timed according to the optical clock signal (output of 20A in figure 1, the clock pulses' role are to retime the system) and re-shaped according to the data in the input optical signal (page 2, paragraph 0020, "a bit pattern of the input optical signal is reproduced, a waveform of each pulse is reshaped").

(2) With respect to claims 2 and 9:

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Otani et al. teaches the all-optical regenerator, wherein the regenerator waveguide provides amplification of the output optical signal relative to the input optical signal (40 in figure 1, the regenerator provides an amplifier and regeneration in 3R is always relative to the input data signal).

(3) With respect to claims 5 and 12:

Otani et al. teaches the all-optical regenerator, further comprising:

a clock recovery unit (16 in figure 1) for recovering timing information from the input optical signal (page 1, paragraph 0017, "the phase of the optical signal accords with that of the optical clock"); and

an optical clock generator (24A in figure 1) to produce the optical clock signal synchronous with the timing information recovered by the clock recovery unit (page 1, paragraph 0017, "24A synchronizes with the output from the phase adjusters").

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otani et al. (20020191259) in view of Goodman et al. (20030235364).

(1) with respect to claims 3 and 10:

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Otani et al. teaches all of the subject matter as described above, except for the all optical regenerator, wherein the regenerator waveguide employs temporal soliton interactions.

Goodman et al. teaches temporal soliton interactions (page 1, paragraph 0005).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use temporal soliton as taught by Goodman et al. in the regenerator taught by Otani et al. since it is known to allow the pulse to retain its shape without spreading over extended propagation distances (page 1, paragraph 0005).

5. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otani et al. (20020191259) and Goodman et al. (20030235364) as applied to claims 3 and 10 above, and further in view of Wise et al. (6,650,466).

Otani et al. and Goodman et al. teaches all of the subject matter as described above, except for the all-optical regenerator, wherein the temporal soliton interactions include cascaded quadratic non-linear solitons or saturating third-order non-linear solitons.

Wise et al. teaches cascaded quadratic non-linear solitons (see title and abstract).

The reference discloses an advantage in using the technique of cascaded quadratic nonlinearities. It should be noted that temporal solitons are known for their capability to be propagated over extended distances without spreading. Wise et al. teaches the technique which is used to create the temporal solitons. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use cascaded

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quadratic nonlinearities taught by Wise et al. to create the temporal solitons taught by Otani et al. since this technique is known for its pulse compression qualities, which have given the temporal solitons their reputation.

6. Claims 6 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otani et al. (20020191259) in view of Tang et al. (4,485,473).

Otani et al. teaches all of the subject matter as described above, except for the all-optical regenerator, wherein the optical clock generator includes a mode-locked laser, an optical delay line, an optical amplifier and an optical frequency doubler, cascaded in series, to generate the optical clock signal.

Tang et al. teaches a mode-locked laser (44 in figure 1), an optical delay line (50 in figure 1), an optical amplifier (54 in figure 1) and an optical frequency doubler (46 in figure 1), cascaded in series (44 goes directly into the frequency doubler, which goes directly into the delay, which in turn goes into the amplifier as shown in figure 1), to generate the optical clock signal (column 3, line 30, all to achieve time synchronization).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to design the clock generator as taught by Tang et al. in the transmitter taught by Otani et al. because it would produced extremely short pulses easily tunable to different frequencies of operation (column 3, lines 32 - 34). In other words the device would have been very flexible.

7. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otani et al. (20020191259) in view of Chaput (20040018020).

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Otani et al. teaches all of the subject matter as described above, except for a plurality of optical signal input nodes each for receiving a respective input optical signal at a respective wavelength; and

a plurality of regenerator waveguides each receiving a respective input optical signal.

However, Chaput teaches a plurality of optical signal input nodes (104 in figure 1, the different input of the multiplexer) each for receiving a respective input optical signal at a respective wavelength (102 in figure 1); and

a plurality of regenerator waveguides (114a, b, c in figure 1) each receiving a respective input optical signal (106 in figure 1, at respective wavelength).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the different inputs taught by Chaput in the transmitter taught by Otani et al. because, in doing so, the capacity of the transmitter will be increased.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Guerssy Azemar whose telephone number is (571)270-1076. The examiner can normally be reached on Mon-Fri (every other Fridays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Guerssy Azemar

10/19/2006



KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER